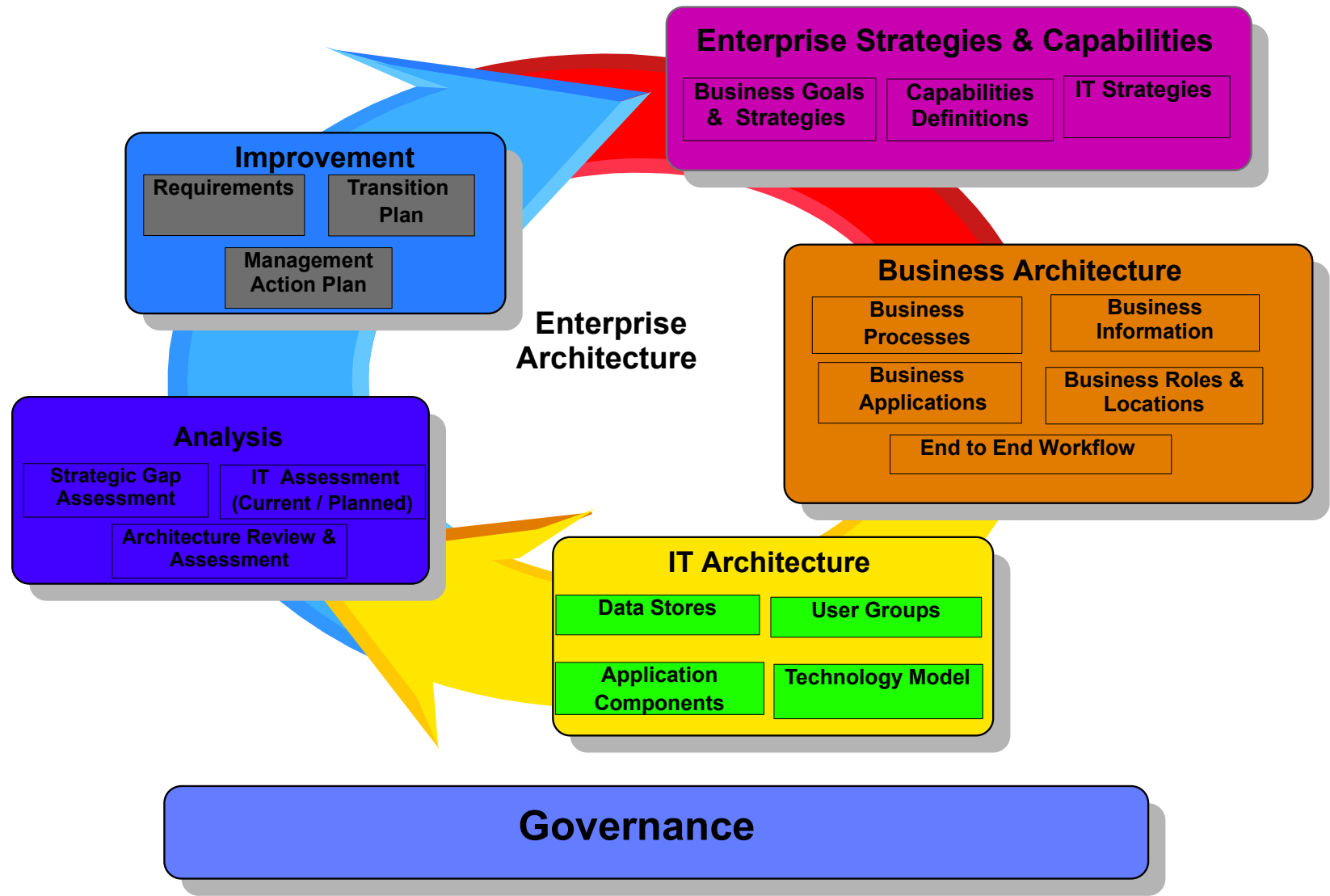# IBM Living Architecture Implementation

Major Topics

- **Enterprise Architecture Approach**

- **IBM Living Architecture Objectives and Approach**

- **LA QualiWare: Support and Implementation**
  - Metamodel Management
  - Repository Management
  - Content Management
  - QualiWare Working Environment

- **Living Architecture: Integrated Tool Support**

- **Critical Success Factors**

Enterprise Architecture (EA) methods provide a business strategy driven approach that enables the parallel consistent development of enterprise business, information and technology architectures, as well as the enterprise solution architecture.

Enterprise Architecture

Enterprise Strategies & Capabilities
- Business Goals & Strategies
- Capabilities Definitions
- IT Strategies

Improvement
- Requirements
- Transition Plan
- Management Action Plan

Business Architecture
- Business Processes
- Business Information
- Business Applications
- Business Roles & Locations
- End to End Workflow

Analysis
- Strategic Gap Assessment
- IT Assessment (Current / Planned)
- Architecture Review & Assessment

IT Architecture
- Data Stores
- User Groups
- Application Components
- Technology Model

Governance

Enterprise Architecture Benefits

The primary benefits of an Enterprise Architecture are to move toward common processes and systems and to foster communication and coordination between the enterprise "domains" (Process, Strategy, Architecture, Technology)

Facilitates planning, impact analysis and decision-making

    Use and reuse of common components

    Utilizes consistent frameworks, blueprints, process models, technology

    Prevent duplicate data being created/deleted by multiple processes

    Facilitates a simplified technology infrastructure

    Impact of changing process or technology can be evaluated

Improves time to market

    Use and reuse of common components

    Uses a structured approach to management and development

    Improved communication through a common definitions (frameworks, blueprints, processes)

Facilitates robust, integrated processes and applications

    Provides a clear baseline to facilitate integration

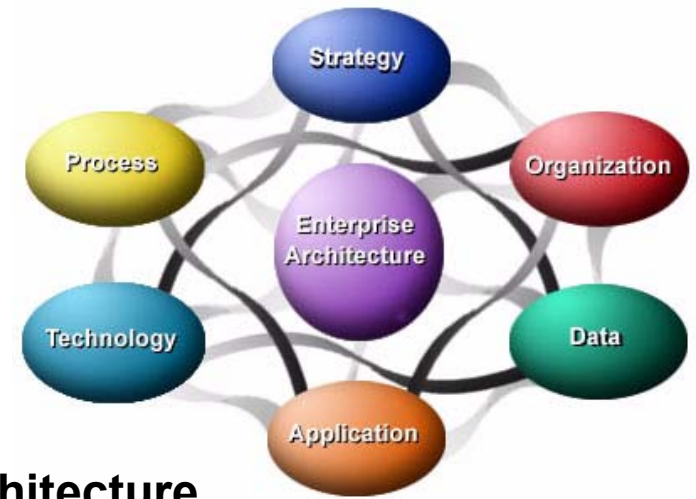**Enables management of organizational role development**

    Uses consistent roles and relationships

Drives continuous improvement

    Able to apply any new requirement against process scope

    Metrics and measurements are designed into the process

Meta Group

Living (Enterprise) Architecture

Objectives:

- **Establish and maintain an integrated Enterprise Architecture**
  - ✓ Enable the cross-enterprise integration, consistency and impact analysis required to accelerate IBM e-business on demand objectives and improve the quality of IT deliverables.
  - ✓ Provides enterprise wide reusable strategy, process, application, data, organization and technology definitions and their required linkages.
- **Enhance e2e integration, IT quality and change impact analysis.**
  - ✓ Provide and maintain clearly defined linkages between corporate wide, unit level, Geo / Regional, Initiative and project level definitions and deliverables.
  - ✓ Enable drill down and roll-up of information across all levels of the EA
  - ✓ Provide integration approach which focuses on common requirements and integration points
- **Enable enterprise, unit and project level content**
  - ✓ Support unit deliverables (definition and implementation), and the Business Transformation Management System deliverables within the corporate wide EA.
  - ✓ Establish clear business unit and enterprise level governance model interlock and expectations. (e.g. Business Units own and control their meta-model and object content)

The IBM Living Architecture enables integration and consistency within and across all levels of IBM's Enterprise Architecture

Enterprise wide Framework

Business Strategies
Business Processes
Initiatives, Capabilities
High Level Data Architecture
Application Architecture

e-business Architecture Blueprint
Roadmaps

Business Strategies

Business Processes **Business Information**

Application Architecture

Technical Environment

Integration Framework

Unit and Cross unit Architectures

Unit Level Architectures
e2e Project Definition
Geographic Roadmaps
Initiative & H/L Project Definition
etc.

e2e Processes

Application Architecture **Logical Data Architecture**

e2e Integration Scenarios

Project Level Architecture

Operational Processes
Detail e2e Workflow
Project Development
Detailed Systems Design

Project A Project B Project C

e2e Operational WorkFlow

Detailed Systems Architectures
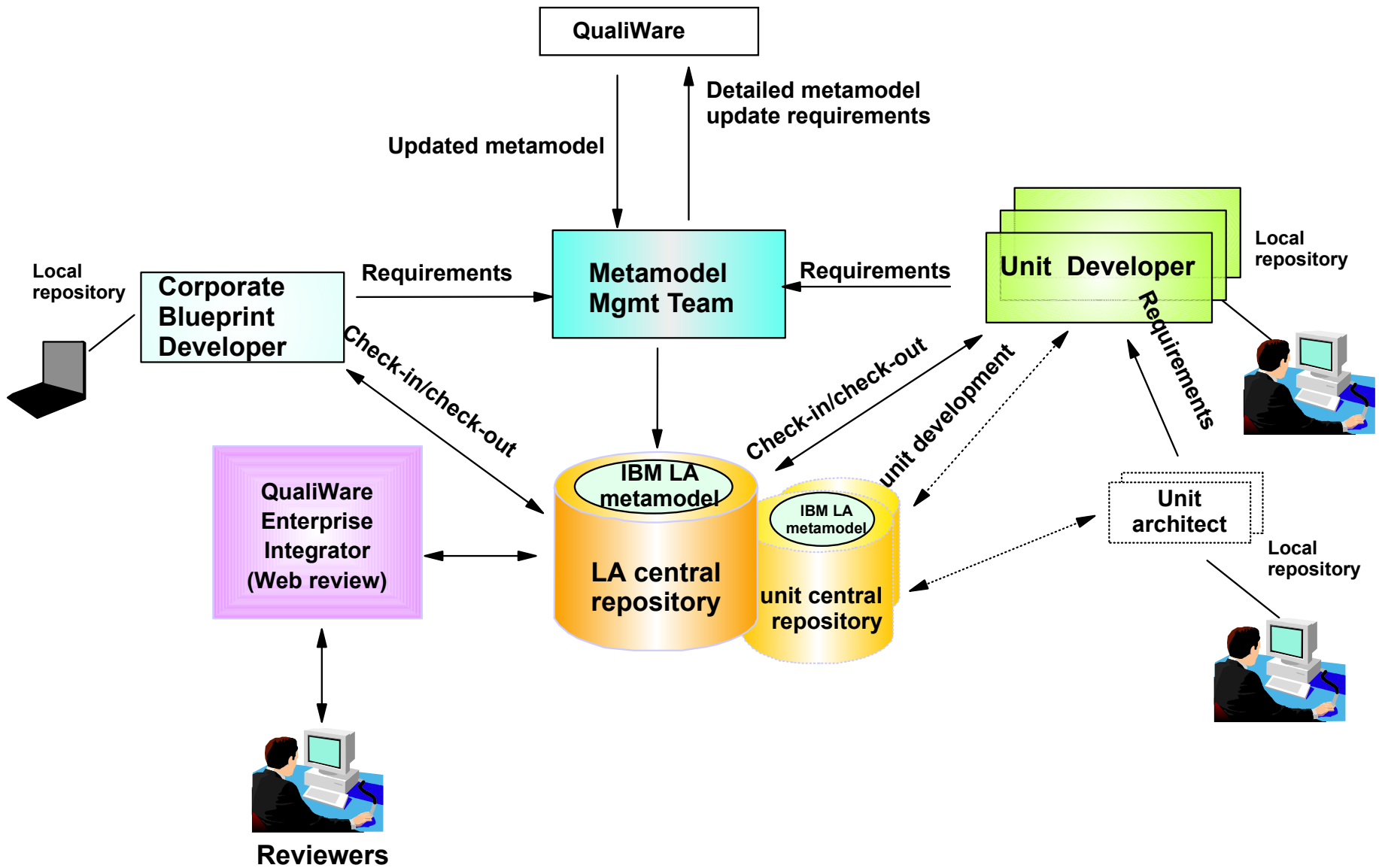
Implementation

Deployment
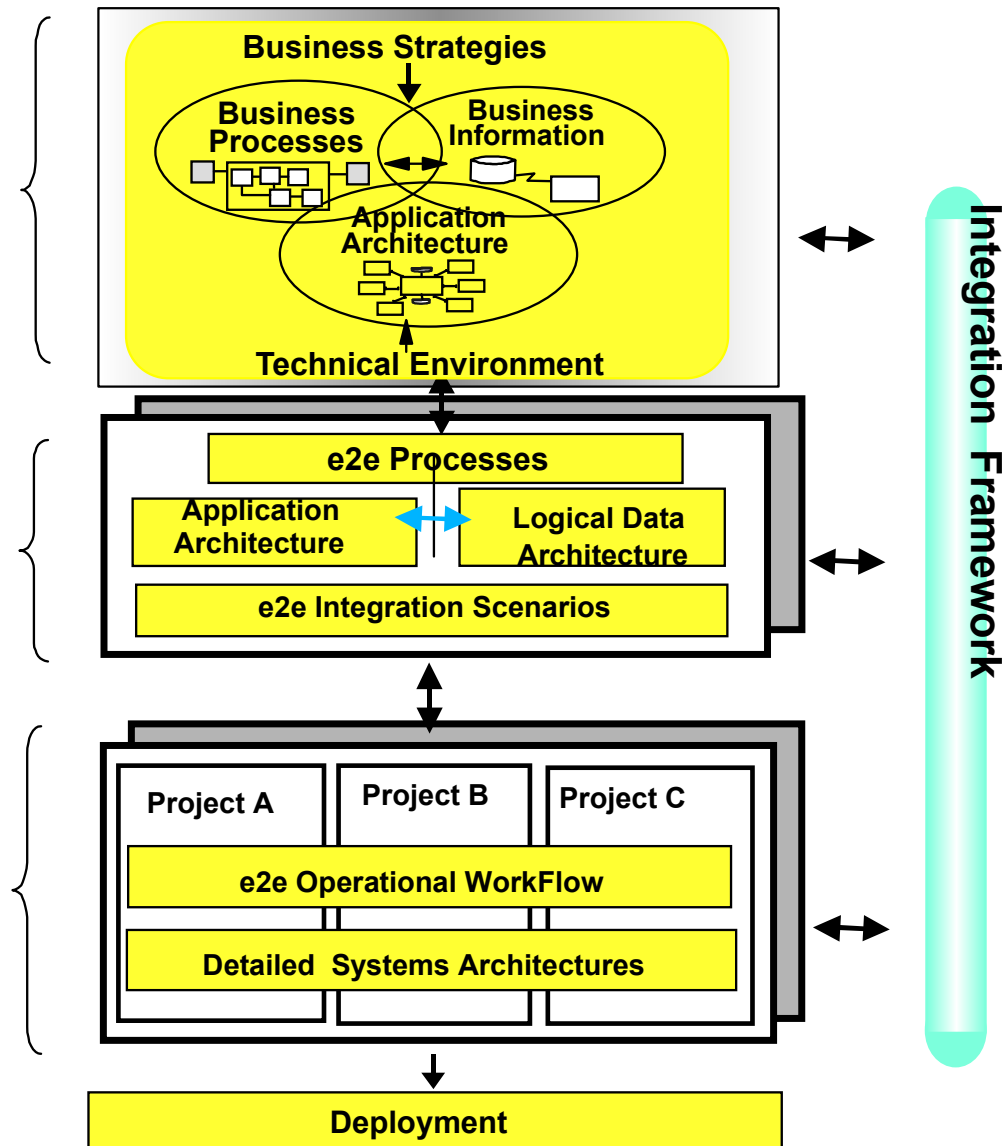
Common metamodel and shared repository enables consistency, integration and analysis at 'All Levels' of the Enterprise Architecture

Enterprise (Living) Architecture Coverage

	Strategy	Process	Application	Data	Technology
Enterprise Level	Describe / manage Strategies, Initiatives and Capabilities Identify Business Rules	Describe / manage the H/L Processes which enable the Strategies (Process Framework)	Describe / Manage Integrated Application Architecture enabling Processes & Strategies (Blueprint)	Describe / Manage the Information which enables the Strategies and Processes (Subject Areas)	Describe / Manage the Technologies which enable the Strategies and Architectures
Logical or Unit Level	Define / Manage Unit Objectives and Metrics	Design unit level processes Design e2e VC processes	Define Unit Level Architectures Provide H/L Application design	Define Business Area Data Model Design Project Level Logical Data Models	Define and Design Technology enablers
Operational Level	Track Project Objectives and Metrics	Design Project Level e2e ,Activity Flow Simulate flow Generate FDL	Detailed Design of Applications/ Components Generate Code	Design Physical Data Models Create ERD diagrams in support of DB2	Develop and, implement Technologies

QualiWare Support Environment

Metamodel Management

QualiWare

Detailed metamodel update requirements

Updated metamodel

Local repository

Corporate Blueprint Developer

Requirements

Metamodel Mgmt Team

Requirements

Unit Developer

Local repository

Check-in/check-out

QualiWare Enterprise Integrator (Web review)

IBM LA metamodel

LA central repository

IBM LA metamodel

unit central repository

Check-in/check-out

unit development

Requirements

Unit architect

Local repository

Reviewers

Metamodel Management

Metamodel Management and Support

- Metamodel tailored to IBM requirements
- Support for ongoing upgrades, units extensions, interfaces or imports
- Cross functional team of stakeholders to manage metamodel requirements and release management
- Support to be provided in creating corporate wide deliverables, reports, etc.

Metamodel Release management

- Updates to LA metamodel are incorporated into QualiWare releases.
- Forward compatibility is supported.
- Backward compatibility is not supported, A warning message is issued to warn an user has a mismatch between the created repository and the metamodel.
- QualiWare QLM has 6 month release cycle. Users will be notified by the metamodel management team when new releases are available to download from the team room.

Repository Management

Common Meta-model

- IBM LA meta-model
- Blueprint repository — **Conceptual Level**
- IBM LA meta-model
- Central repository
- IBM LA meta-model
- unit central repository — **Logical / Physical Level - (unit level)**
- Project Repository
- Project repository
- **Logical / Physical Level - (unit level)**

- **Enterprise and Project level repositories**
  - ► Central repository contains all finalized content
 - ► Project repositories contain unit and project views
- **Disconnected work and synchronization of repositories**
- **Linked project repositories**
  - ► Project repositories will have links to all required content in other repositories
  - ► Enables reuse, simplifies synchronization
- **Unit unique repositories**
  - ► Used for unique requirements for unit
  - ► Meta-model based on LA meta-model with unit-built extensions
  - ► Promotes common data to LA repository when approved
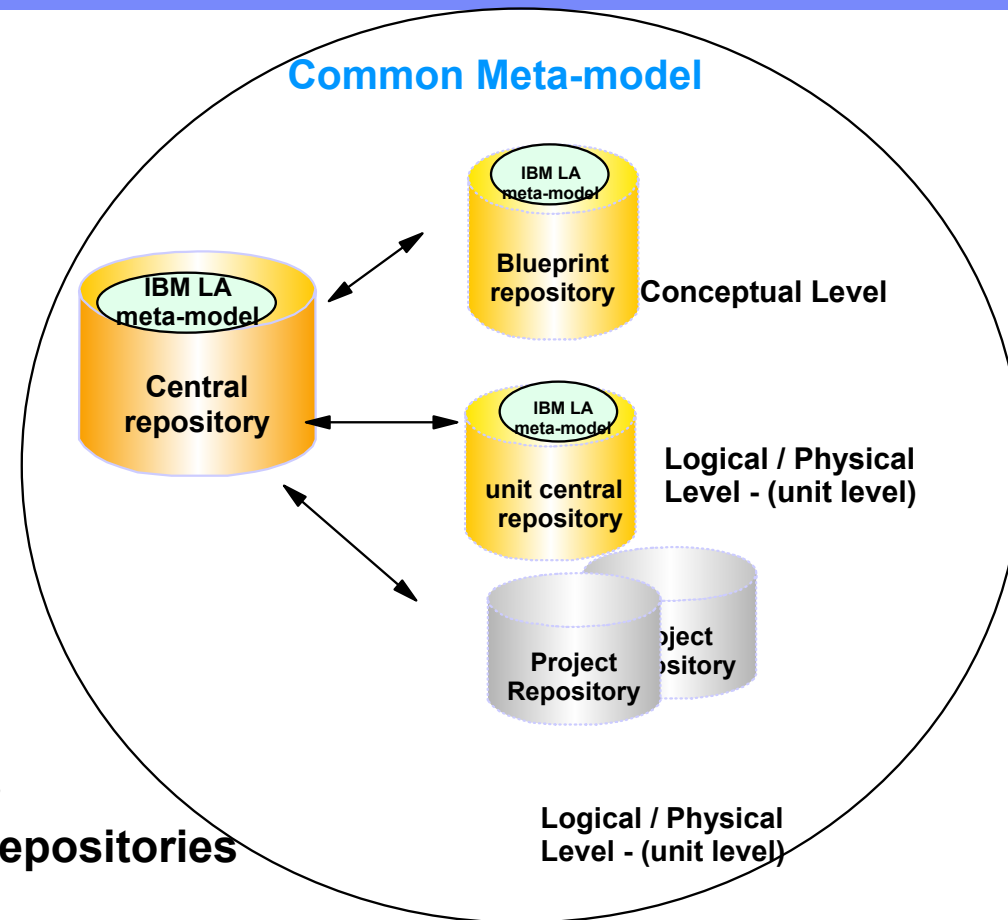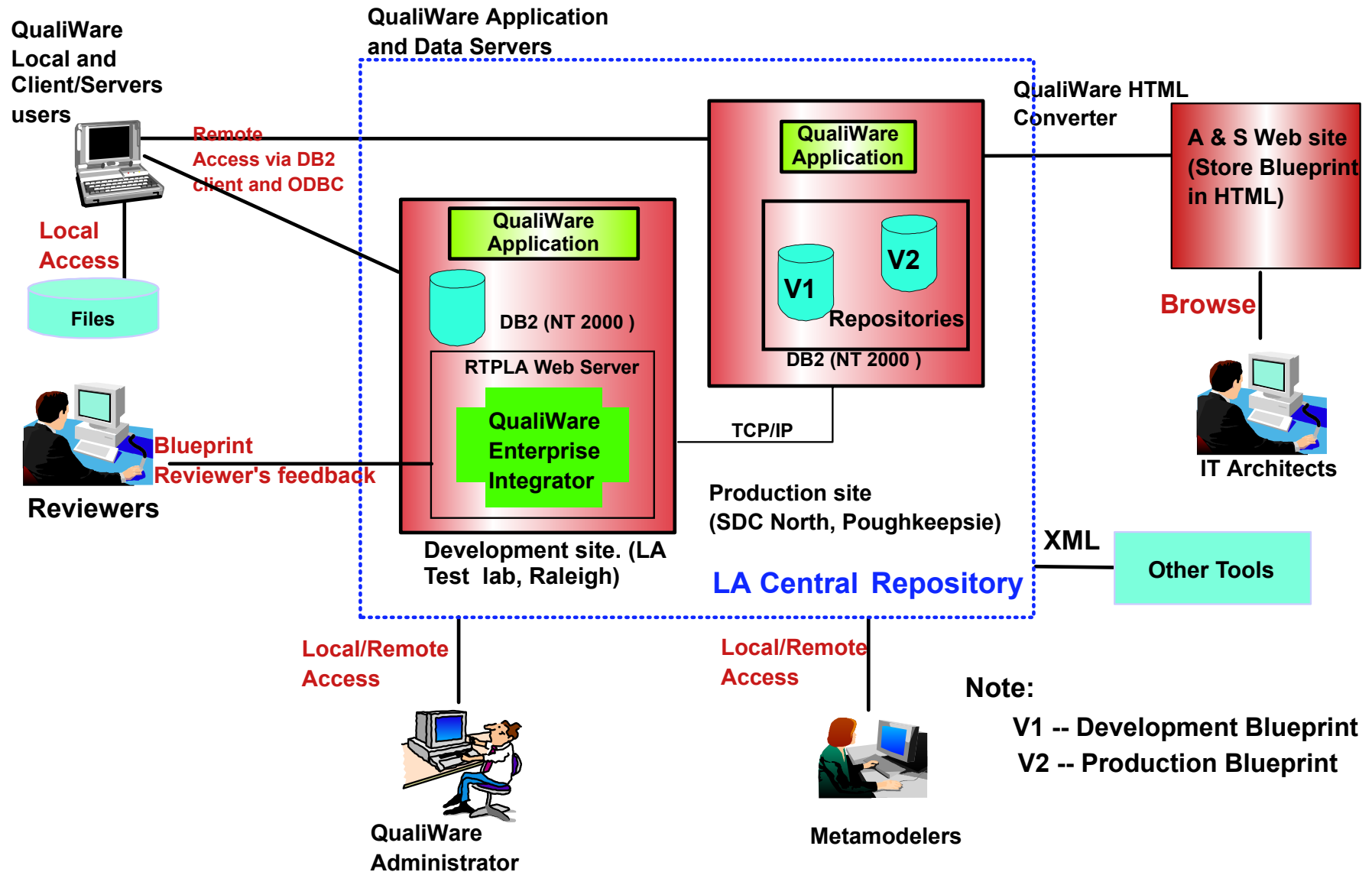
Repository Administrator's Responsibilities

- Manage the Living Architecture Repository interfacing with other functional groups in establishing and maintaining a development/test lab.

- Perform QualiWare License Management and License Distribution.

- Manage the production central repository which is stored in the DB2 database. The central repository management includes: check in/check out, user access authorization, backup, etc.

- Resolve user questions, technical issues related to the use of the Living Architecture repository and QualiWare licenses .

- Participate in activities to update the Living Architecture Support and Management System

- Evaluate the QualiWare DB2 interface, QualiWare Java Roundtrip, QualiWare XMI interfaces and other related QualiWare applications.

✓**Note:** The most convenient and beneficial way to administer the complete spectrum of the QualiWare working environment is to have one administrator to organize, monitor, and manage all server components through one machine if at all possible.
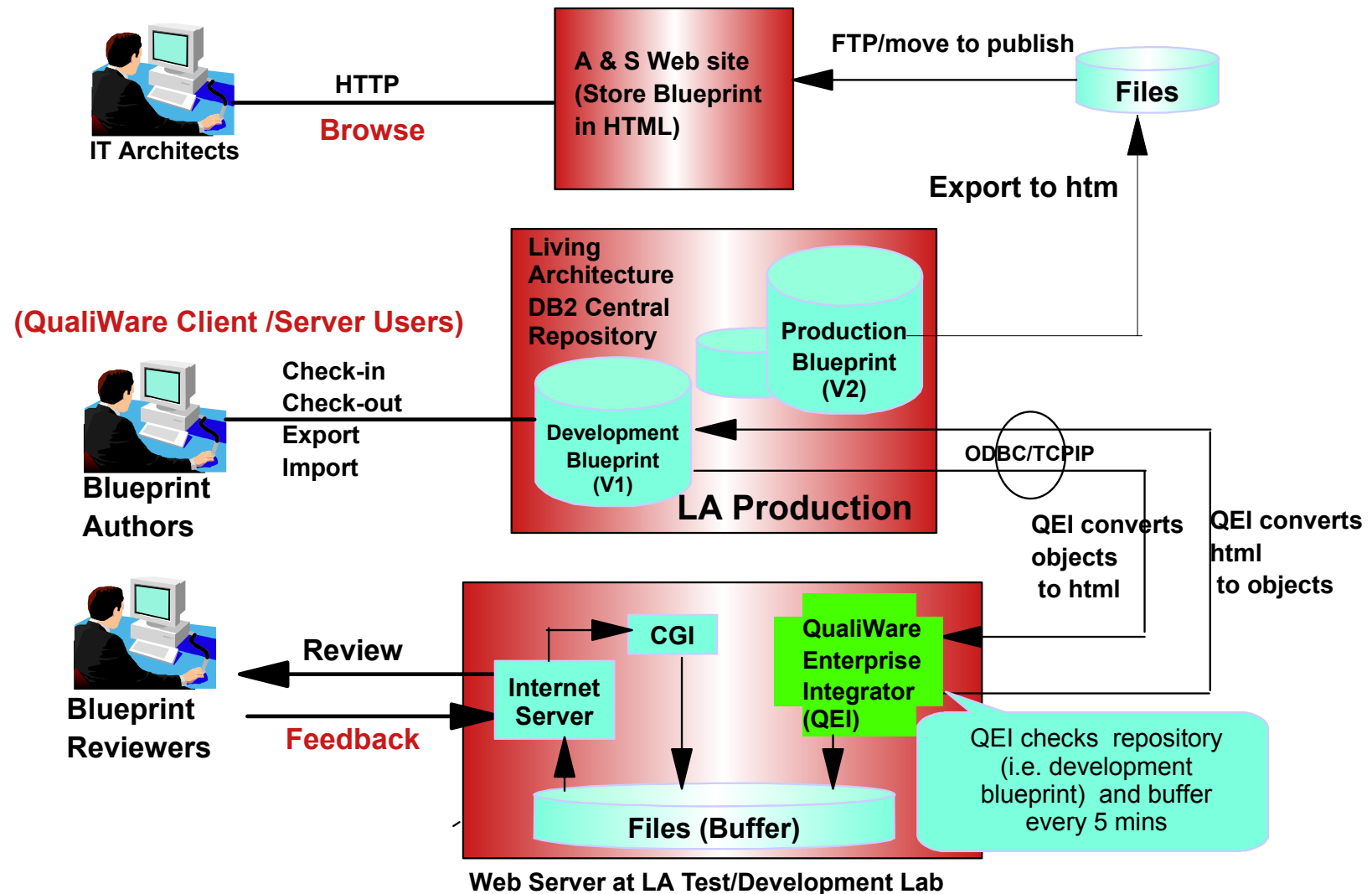
Content and Metamodel Management

- **Management and Approval of content at major levels of the LA**
  - ► Cross Enterprise level content /deliverables are managed /approved by corporate teams
  - ► Unit and project level content / deliverables are managed / approved by unit representatives
- **Management of content of specific objects and diagrams (Tool Access & Ownership)**
  - ► Each user is belongs to one of more teams
  - ► Units own their own content and define their teams
  - ► Access control is managed by the corporate repository administrator
- **Management of Integrated meta-model requirements**
  - ► Core meta-model team manages meta-model requirements and integration
  - ► Cross functional meta-model team address meta-model priorities and ensures consistency and integration

QualiWare Working Environment

QualiWare Local and Client/Servers users

QualiWare Application and Data Servers

Remote Access via DB2 client and ODBC

Local Access

Files

QualiWare HTML Converter

QualiWare Application

A & S Web site (Store Blueprint in HTML)

QualiWare Application

V2

V1

Repositories

DB2 (NT 2000)

DB2 (NT 2000)

RTPLA Web Server

QualiWare Enterprise Integrator

TCP/IP

Browse

IT Architects

Blueprint Reviewer's feedback

Reviewers

Development site. (LA Test lab, Raleigh)

Production site (SDC North, Poughkeepsie)

LA Central Repository

XML

Other Tools

Local/Remote Access

Local/Remote Access

Note:

V1 -- Development Blueprint

V2 -- Production Blueprint

QualiWare Administrator

Metamodelers

Architecture Blueprint Publication, Development and Review

IT Architects

HTTP
Browse

A & S Web site
(Store Blueprint
in HTML)

FTP/move to publish

Files

Export to htm

(QualiWare Client /Server Users)

Blueprint
Authors

Check-in
Check-out
Export
Import

Living
Architecture
DB2 Central
Repository

Development
Blueprint
(V1)

Production
Blueprint
(V2)

LA Production

ODBC/TCPIP

**QEI converts
objects
to html**

**QEI converts
html
to objects**

Blueprint
Reviewers

Review

Feedback

CGI

Internet
Server

QualiWare
Enterprise
Integrator
(QEI)

Files (Buffer)

QEI checks repository
(i.e. development
blueprint) and buffer
every 5 mins

Web Server at LA Test/Development Lab

IBM Living (Enterprise) Architecture

Tool Support and Integration

Enterprise (Living) Architecture: Tool Support

	Strategy	Process	Application	Data	Technology
Enterprise Level	Describe / manage Strategies, Initiatives and Capabilities Identify Business Rules s	Describe / manage the H/L Processes which enable the Strategies (Process Framework)	Describe / manage Enterprise wide Application Architecture enabling Processes & Strategies (Blueprint)	Describe / manage the Information which enables the Strategies and Processes (Subject Areas)	Describe / manage the Technologies which enable the Strategies and Architectures
Logical or Unit Level	Define / manage Unit Objectives and Metrics	Design unit level processes Design e2e VC processes	Define Unit Level Architectures Provide H/L Application design	Define Business Area Data Model Design Project Level Logical Data Models	Define and Design Technology enablers
Operational Level	Track Project Objectives and Metrics	Design Project Level e2e ,Activity Flow Simulate flow Generate FDL	Detailed Design of Applications/ Components Generate Code	Design Physical Data Models Create ERD diagrams in support of DB2	Develop and, implement Technologies

Legend:
- ▭ QualiWare
- ▭ Holosofx
- ▭ Rational XDE

Living Architecture Tool Integration

Holosofx

Process Activity models

Process Simulation

Dashboards

Rational XDE/Rose

Rational Test Suite

QualiWare

IBM LA metamodel

IBM LA metamodel

IBM LA metamodel

Blueprint central repository

LA repository

unit central repository

Erwin

XML Interface Data - Process

Enterprise (LA) Metamodel Management Team

Requirements

Requirements
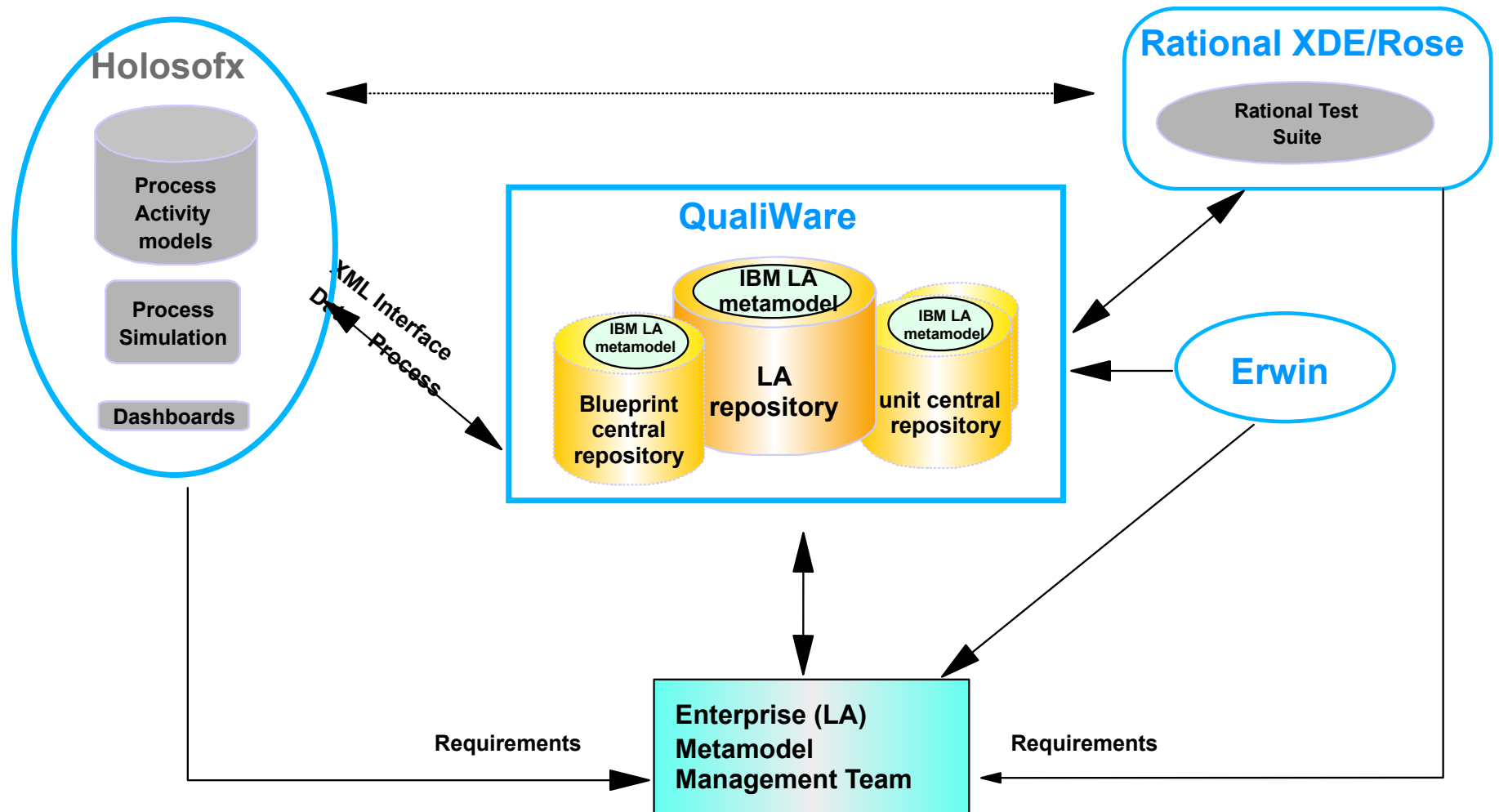
Living Architecture Tool Integration: Next Steps

■ **Living Architecture provides cross unit Enterprise Architecture**
  ► **QualiWare will support Enterprise wide EA and unit deliverable**
  ► **QualiWare provides EA integration environment**
  ► **WIP on integration of Strategies, Initiatives and Technology**

■ **Holosofx / QualiWare Integration**
  ► **Holosofx is primary tool for Process Definition**
    ▪ Activity Workflow. Resuable processes
    ▪ Translation to MQ Workflow
    ▪ Holosofx will import 'LA' Subject Areas (Phi Type) and Application Definitions
    ▪ LA will import Holosofx process models. Models can be viewed and analyzed in QualiWare
  ► **XML interface status: (2 way) in development**
    ▪ Dependent on Holosofx 'fix' to some bugs in interface. Review status on 04/10

■ **Rational / QualiWare Integration**
  ► **Rational is primary tool for Solution Development**
    ▪ Rational XDE and Rose for Logical and Physical Solution Design and Code Generation
    ▪ Detailed assessment of Linkage between QualiWare and XDE environments in progress
  ► **XMI Interface status:**
    ▪ QualiWare / Rose - XMI interface exists
    ▪ XDE will have XMI capability in May. Will follow-up with I/F plans in May

■ **Holosofx / Rational Integration**
  ► **Websphere / Rational integration in Product Plan**
  ► **XMI Interface between Holosofx and Rational Planned (availability TBD)**

Enterprise Architecture: Critical Success Factors

- **Understand your Business and IT objectives**
- **Executive Sponsorship**
  – Proactive Executive sponsorship is critical to successful implementation and governance.
- **Business and IT stakeholder support and 'buy in'**
  – Committed Stakeholders across major Domains:
    Strategy. Process. Data, Application and Technology
- **Cross Unit Participation and Support**
  – Active use of the EA for enterprise and unit level work
  – Support of unit level projects
- **Resource to support successful definition and implementation**
  – Metamodel definition
  – Requirements management
  – Tool integration and method alignment
  – Extended team support: ensure success of unit level work
  – ongoing Education

Backup

Management system for Living Architecture

Deliverables Responsibility

- **Corporate**

  ‣ Metamodel management

  ‣ Education material

  ‣ QualiWare Licenses

  ‣ Documentation

  ‣ Environment

  ‣ Support

- **Units**

  ‣ Education funding

  ‣ Resource for Architecture Blueprint Development

  ‣ Additional license funding

Major Elements of the Metamodel:
Reusable Components and Deliverables
Initial Content

Strategies , Initiaties Organization

- BT Strategies
  - ✓ Strategies mapped to organization
  - ✓ Strategies mapped to Process & Applications
  - ✓ Business Strategies coverage analysis
- Initiatives
  - ✓ mapped to strategies
  - ✓ mapped to org
  - ✓ mapped to process
- Organization Model

Business Process

- Business process
  - ✓ Definition, hierarchy
  - ✓ Business rules
  - ✓ CIC classification by Value Chain
  - ✓ Architecture Control Points by process
  - ✓ Process to Application (derived view)
  - ✓ Metrics
- Business Process Network
  - ✓ Process Relationships
  - ✓ Information flows
- ValueChain process coverage
- E2E Design Flows
  - ✓ Analysis diagram

Strategic Data

- Subject Areas / Info Cats
  - ✓ Definitions, relationships
- Business Data Classification
  - ✓ Definitions, relationships
- Data use (CRUD)
  - ✓ Data Use by process
  - ✓ Data use by application (derived)
  - ✓ Highly shared data identified
- Logical Data Model
- E/RDs and Business Rules
- Physical Data Model
- Information Flows/Trusted Data Sources

Application

- Strategic applications
  - ✓ Description, Type
  - ✓ Ownership/vendor
  - ✓ Control Point to process
  - ✓ Implementation criteria, e.g., strategic data stores, integration criteria
  - ✓ Interfaces/ protocols
  - ✓ Technology Characteristics
  - ✓ Performance Information
- Information Flows
  - ✓ Data sent or received
  - ✓ Required sources
  - ✓ Frequency,
  - ✓ Associated interface
  - ✓ Transformations
- Detailed (project-level) application architecture

Architecture Integration

- H/L Blueprint Architecture
- Collab/ BPE Architectures
  - ✓ Application relationship to processes and data
- Value Chain E2E architectures
- Value Chain Roadmaps
- e2e Architecture Scenarios
- Reports and Analysis
- e2e Workflow

Major Objects or Domains: Phase 2 Content

Strategy

- **Architecture Principles**
- **Business Strategies**
- ✓ Definition
- ✓ Organization
- ✓ Supporting Process
- ✓ Supporting Initiatives
- ✓ Timeframe
- **Initiatives**
- ✓ Definition
- ✓ Organizations
- ✓ Processes supported
- ✓ Supporting Information Systems
- ✓ Timeframe
- ✓ Mapped to Strategies
- **Strategy** Model
- ✓ Goals
- ✓ Strengths
- ✓ Weaknesses
- ✓ Opportunity
- ✓ Threat

Organization

- **Organization model**
- ✓ Business Unit, Georgaphy, Country, Value Chain, etc.
- ✓ Linked to Information Systems Business Processes, Strategies, Initiatives, Technology

Business Process

- **Business Processes**
- ✓ Definition
- ✓ Parent Processes
- ✓ Sub Processes
- ✓ Business rules
- ✓ CIC classification by Value Chain
- ✓ Architecture Control Points by process
- ✓ Supporting Information Systems
- ✓ Related Strategies
- ✓ Related Initiatives
- **ValueChain process view**

Data

- **Subject Areas**
- ✓ Definition
- ✓ Hierarchiy
- ✓ Data Steward
- ✓ Associated Entities
- ✓ Associated Data Models
- **Data Entities**
- ✓ Definition
- ✓ Attributes
- ✓ Characteristics (Cardinality, etc.)
- **Attributes**
- ✓ Characteristics (Type, etc.)
- **Data use (CRUD)**
- ✓ Data Use by process, application, etc.
- ✓ Highly shared data identified
- **Logical Data Models**
- ✓ linked to Subject Areas
- ✓ link Physical views
- **E/RDs and Business Rules**
- **Physical Data Models**
- ✓ Tables
- ✓ Columns
- ✓ links to logical view
- ✓ links to Subj Areas
- **Data Dictionary**
- ✓ Definition,
- ✓ Relationships, etc.
- **Data Transformations**
- ✓ Data Mapping, etc.

Information Systems

- **Information Systems**
- ✓ Description, Type
- ✓ Ownership/vendor
- ✓ Control Point to process
- ✓ Value Chain Usage
- ✓ Implementation criteria, e.g., strategic data stores, integration criteria
- ✓ Product Coverage
- ✓ Geographic Coverage
- ✓ Interfaces Protocol,Transport
- ✓ Technology Characteristics Platform, Application Location (Client, Server),etc.
- ✓ Performance Information
- ✓ Relationship to Processes data, Initiatives, etc.
- ✓ Deployed locations and status
- ✓ Releases
- ✓ Component
- **Information Flows**
- ✓ Description
- ✓ Data sent or received,
- ✓ Defined by Subject Areas, Data Entities
- ✓ Required source of data
- ✓ Frequency
- ✓ Associated interface
- ✓ Related Data Models

Technology

- **Infrastructure**
- ✓ Server
- ✓ Network
- ✓ Location
- ✓ Linked to Organization, Application, Strategy

Green = Planned,but not implemented yet